

RECOMMENDATIONS

The main objective of this project was to provide a comprehensive summary of our state-of-knowledge of the origin of sediments, their composition and size, and their inferred dispersal and flux within the Albemarle-Pamlico system. The following recommendations are thus made on the basis of this literature review and reflect scientific information needs in the three areas below. Specific recommendations are to focus future research efforts on answering the priority questions outlined in the following paragraphs.

1) Suspended sediments in the water column. The literature review clearly points out that we have considerable knowledge about the distribution of grain sizes on the bottom and their mineralogy and sedimentary structures. The basic information we lack concerns the particles in the water column and the processes that have led to the observed bottom deposits. The most pressing questions concerning suspended sediments are: What is the spatial distribution of suspended sediment (lateral and vertical), and how does it change through time? What is the dispersal pathway of sediments once they reach the estuarine portions of the rivers? Does an estuarine turbidity maximum always exist, and, if so, is it tied to recirculation of suspended sediments upstream? What are the settling rates of suspended sediments, and do they settle as individual particles, electro-chemically bound floccules, or as organically-bound marine-snow agglomerates?

2) Seabed accumulation. Although the bottom sediments throughout nearly all of the Albemarle-Pamlico system have been described, the descriptions are based mostly on surficial grab samples. A wealth of information is also contained in the underlying deposits since this is where past conditions have been recorded. Furthermore, if pollutants are adsorbed onto sediment particles, then the accumulation sites for sediments are also the accumulation sites for pollutants, at least until such time as they are released diagenetically or through resuspension. The most pressing questions are: What is the ultimate fate of sediments that enter the system from the rivers? What are the average rates of sediment accumulation? Where do sediments accumulate most rapidly? Have the accumulation rates changed over historic times and over the past, say, 100 years as a result of land-use practices?

3) Seabed - water column exchange processes. An important consideration in the release of nutrients or toxic substances that are adsorbed onto sediment particles concerns what exactly happens when sediments reach the bottom. The fundamental question is: Are the accumulation sites temporary or permanent? A careful distinction must always be made between deposition and accumulation. Whereas deposition refers to temporary emplacement of particles on the seabed, accumulation is the net sum of many episodes of deposition and removal. Thus the seabed and water